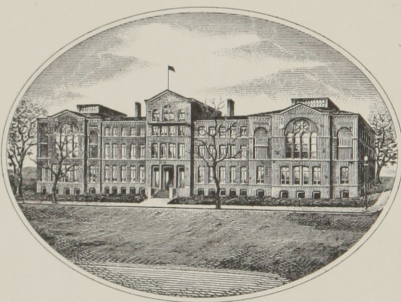


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U. S. Department of Health, Education, and Welfare
Public Health Service

AN INAUGURAL
DISSERTATION,

O N

Cholera Morbus

SUBMITTED TO THE EXAMINATION
O F T H E
REV. JOHN EWING, S. T. P. PROVOST;
T H E
TRUSTEES AND MEDICAL PROFESSORS
O F T H E
UNIVERSITY OF PENNSYLVANIA;

FOR THE DEGREE OF DOCTOR OF MEDICINE:
ON THE TWELFTH DAY OF MAY, A. D. 1791.

BY DAVID HOSACK, A. B.
OF NEW-YORK.

ESTIMATIO CAUSÆ SÆPE MORBUM SOLVIT.

CELsus.

N E W - Y O R K:
PRINTED BY SAMUEL CAMPBELL.
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M.DCC.XCI.

TO

Bk 15 20 Nov '50
RICHARD BAYLEY,

SURGEON NEW-YORK:

THIS DISSERTATION,

Is most humbly addressed,

With every Sentiment,

Of Esteem and Respect,

By his much obliged,

Friend and Pupil.

T O

RESCUE D. D. D. E. E.

Bureau New York.

THIS DISSEMINATION

Is now being addressed.

With every benignant

Of Reform and Relief.

By his much obliged.

Friend and Legist.

T O

Nicholas Romaine, M. D.

PROFESSOR of the THEORY and PRACTICE of MEDICINE,
N E W - Y O R K.

S I R,

IT is with the greatest pleasure that I now embrace an opportunity of acknowledging the obligations I am under, not only to your friendship, but also to the instructions I have received from your valuable Lectures.

THE indefatigable zeal, with which you have filled the Medical Chair, be assured, Sir, has been no less honorable to yourself, than beneficial to your Pupils.

BE pleased to accept this public acknowledgement, and believe me to be,

S I R,

Your Sincere Friend,

And very humble Servant.

Wm. D. ...

... THEORY ...

... AND ...

It is with the greatest pleasure that I now can
I have an opportunity of acknowledging the
obligations I am under, not only to your friend,

but to you also, to the latter of whom I have received
from your valuable lecture,

... which you have
... the Medical Clinic, the ...
been no less honorable to yourself, than beneficial
to your ...

...
... and ...

Your sincere friend,

And very humble servant,

T O

WILLIAM SHIPPEN, ADAM KUHN, AND
JAMES HUTCHINSON,

MEDICAL PROFESSORS of the UNIVERSITY of *Pennsylvania*.

TO you, Gentlemen, I also feel myself peculiarly obligated.—As a small testimony of my gratitude and respect, I have taken the liberty to address you upon this occasion.

It was not with the intention to compliment your abilities, either as Men of Science—Professors of the Healing Art,—or as Citizens;—in either of these characters, your fame is too extended to admit any addition which my pen could attempt —With this small testimony then of my esteem and gratitude,

I Remain, GENTLEMEN,

Your ever devoted,

And most humble Servant,

THE AUTHOR.

TO
WILLIAM SHIPEN, ADAM KUHN, AND
JAMES HUTCHINSON,

Medical Professors of the University of Cambridge.

TO you, Gentlemen, I also feel myself per-
sonally obligated—as a small testimony of
my gratitude and respect, I have taken the li-
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It was not with the intention to compliment
your abilities, either as Professors of Science—or
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I remain, Gentlemen,
Your ever devoted

And most humble servant,
THE AUTHOR.

AN INAUGURAL
DISSERTATION

O N

Cholera Morbus.

WHAT DEMOCRATES observes of the womb, that it is an *animal* within an *animal*, may not be improperly applied to the *Stomach*. This organ, in a natural and healthy state, like a faithful well-armed *Centinel*, is always on the watch, who, when attacked, either repels the enemy, or perhaps deprives him of his arms, without which he is now incapable of defence.

We cannot give a more striking instance of this wonderful ~~influence~~ ^{*influence*} of the stomach, than by ob-
B serving

erving of some poisons, that when taken in, they are immediately rejected, while others are subdued; divested of their malignant properties, and even rendered articles of nourishment—but to continue our simile, the Centinel may be at times betrayed, and whom he thinks a friend, may prove an enemy;—thus, with the stomach, poisons may insidiously steal in under the fair appearance of wholesome food, and thereby induce the long train of diseases, with which this organ is so frequently affected;—of the diseases ^{thus} ~~they~~ induced the Cholera Morbus, which I have chosen as the subject of the following Dissertation, is not among the least frequent, and I had almost said, the least fatal.

This disease consists of a frequent bilious vomiting and purging, accompanied with anxiety and oppression:—Spasmodic affections of the bowels and abdominal muscles, which are often extended to the legs and other parts of the system.

It

It for the most part attacks in Paroxysms, which however are repeated very irregularly like other diseases, it has its *Premonitors*; which are acid eructations and griping pains, particularly in the region of the stomach, occasioning for the most part, a sense of distention similar to that from flatulency as in Dyspepsia;---to these, add Nausea, followed with vomiting, and the symptoms above mentioned;---the disease thus continuing, the abdomen becomes hard and extremely painful to the touch, accompanied with great heat and anxiety, which are again followed with cold clammy sweats; the pulse now becomes small, frequent, and very irregular, often times intermitting and scarcely perceptible,---the countenance pale, with every other appearance of approaching death, as a coldness of the extremities---subfultus tendinum, &c.---This, I believe, is a true description of the disease if violent and left to nature, when it for the most part terminates fatally, and that as is generally observed

upon the third or fourth day, but if mild, it may continue a day or two, and perhaps cease of itself; this happy termination, however, we are not to look for, without the assistance of Medicine. The febrile symptoms, it is remarked, seldom appear in the first stage, when the disease, however has continued sometime, the pulse and respiration become both more frequent and very irregular. There is also a difference to be observed in the matter discharged;---in the beginning it is generally observed to be remarkably acrid, and more or less of a green eruginous color;---but towards the close of the disease, it changes from the green to a more yellow, which last approaches the natural color of the bile.

This disease is most common as an endemick in the months of July and August, appearing however earlier, or continuing later, as the weather is more or less warm; cases sometimes occur, however even in the cold of winter, which fact, in my opinion, is not perfectly consonant with

with the theory hitherto admitted upon the subject of Cholera;---it has, however, never yet been taken notice of by writers. I will, therefore add, from the information of Doctor Kuhn, that it is not an uncommon occurrence.—I am also acquainted with a lady who assures me, she has been frequently attacked in the months of December and January, when the ground was covered with snow,---a fact, by no means surprising, agreeable to the pathology I shall advance in the following pages, more especially when I observe, that this lady's diet consists chiefly in vegetables.

The *Proximate* cause of Cholera, is evidently an increased secretion of bile, which either from an increased acrimony, or which is most probable, merely from the quantity being increased, irritates the stomach and intestines, and thus induces those violent symptoms above enumerated.---Dr. Cullen has divided this disease into two species*, the one which he denominates *spontaneous*, arising

* See his Synopsis.

in a warm season without any manifest cause—the other *accidental*, or which is produced from acrid matters taken into the system.

The object of this Dissertation will be, to trace the first of these species to its causes, and if possible thereby to refute the theory which has been, and is still so generally received, and which I will add has given rise to a very vague and uncertain mode of treatment. When we observe, that this disease occurs only in Southern or ^{the} warmest seasons of temperate, climates, and that its danger and frequency are in proportion to the temperature of the air, we need not be surprised at the so common opinion which Physicians have adopted, in ascribing it to *heat* as its ^{causing} ~~existing~~ cause; but on the other hand, when we also observe, that during the prevalence of this disease, (viz. in the months of July and August) our diet abounds in the use of vegetables, but more especially the acid and acescent ^{fruits} ~~fruits~~, we may at least ask the question, can they not produce it? for
upon

upon the principles of heat alone, many circumstances, both in the nature and cure appear inexplicable. “ In the case of a genuine Cholera, says Doctor Cullen, the cure of it has been long established by experience.”* But from the bills of mortality in this country, as well as from those of Europe we learn, that among the diseases of children, Cholera, in point of fatality, stands at the head of the list;—how far this fact accords with the above observation of Doctor Cullen, I leave the Reader to determine,—to me they appear somewhat incompatible.

Perhaps it may be urged, and with propriety, that in some instances we are called at so late a period of the disease, that we are just in time to see our Patient expire.—Nay, so great and sudden is the debility it induces, that some cases have been known to terminate fatally in the short space of sixteen hours; but called at whatever period of the disease;—the first indication, agree-

* See his first Lines of the Practice of Physic.

ably to the present practice with the greater part of Physicians, is invariably to evacuate the offending matter which is already pouring out *quaqua versum*, and almost without intermission;—to answer this indication, an emetic is prescribed,---succeeded by a purgative, and (could we be so candid as to acknowledge the truth) not unfrequently with death. Would Physicians in this, as well as many other diseases, more strictly observe that best of motto's, "*Respice finem*" perhaps Cholera, by a different treatment, instead of occupying its present place in the bills of mortality, would be considered like an Ephemera or fever, that lasts but for a day. From the above treatment of this disease,---its fatality, and even if cured, its obstinacy in yielding to the usual remedies, we are naturally led to enquire, whether it may not proceed from some other cause than that of heat, by which we may prescribe a more safe and certain remedy, than either a vomit or a purge. For this purpose, and for reasons
before

before hinted, it will not be improper to enquire into the effects of vegetables, more particularly the summer fruits, which in these climates and seasons make so great a part of our diet; nay, I will add, so important a part, if, while eating, we for a moment reflect, that the palate is not always a faithful guide, but frequently as in the present instance, discovers our error when it is too late.—The principal effect which I shall notice, from the too liberal use of the vegetable acids, is the debility they induce, but more especially in the first passages: This effect we particularly observe in Chlorosis, Dyspepsia, Hypochondriasis, and Hysteria, all which diseases, it is well known, are aggravated by the use of them; to these add the Atonic Gout, which has even been induced by a single draught of four punch; nay, to extend the idea, need we be surpris'd when Galen tells us, that they have produced an intermittent fever? especially when we consider the consent or sympathy between the stomach and the different parts of the system;—granting then, that a *diet* of this nature, has occasioned a loss of tone in this important organ, and of course, rendered

dered it incapable of performing its proper functions; it may readily be conceived in what manner this increased secretion of bile is produced, especially when we add, that this secretion is for the most part, proportioned to the acid present, ~~in~~ the Stomach and Duodenum.*

Since then, the bile is secreted in a greater quantity in this debilitated irritable state, of the stomach

* That the vegetable acids increase the secretion of bile, from their stimulating effects upon the excretories of the liver, (between which, and the alimentary canal, there is a very peculiar and intimate connection) is now, I believe, pretty generally admitted, (See Ramsay's Thes. Inaug. Edinb. 1757.—See also Moore's Inaug. Dissert. Edinb. de Bile, 1780.) granting this, a question very naturally arises, What would be the effects from a liberal use of the vegetable acids in that species of Jaundice, which arises from biliary ~~concretions~~ ^{calculi} in the gall bladder? and which, by the bye, is the most common species of that disease. (See Morgagni—Monro, and Cullen.—The following fact, taken notice of by Butchers, (in my opinion) answers this question in the most satisfactory manner, viz. that in the summer months, examining the gall bladders of cattle, they seldom or never meet with gall stones, while, in the winter months, they seldom or never find a gall bladder without them, owing unquestionably to the difference of their food;—which, in the one case, undergoes an acetous fermentation, occasioning, as before observed, ^{inducing} increased secretion of bile, which either by actually ~~dissolving~~ ^{dissolving} these concretions, or which is most probable, by distending the gall bladder and biliary ducts removes them.

stomach and intestines, we are at no loss in accounting for the effects produced, independent of the more *acid* state of the bile so much talked of in this disease, and which *acidity* I conceive, may be owing to the acid it meets with in the stomach that gives ^{urc} ~~urc~~ to the idea. This increased acrimony of the bile, some urge as the cause of the violent vomitings and purgings in this disease; but from the experiments of *Arnauld* and *Monro*, upon the emetic qualities of the bile in its natural state, I observe that an encrease in quantity alone is fully adequate to the effects produced.

From these circumstances, I am of opinion, that acidity in the stomach, whether generated by the heat of the climate, want of exercise, or which, I consider as the more frequent source, (from the excessive use of acids and acescent ~~fruits~~ ^{fruits}) is the true cause of Cholera, and most of the diseases termed bilious, so common in hot climates, not that I would consider heat as totally inefficient: On the contrary, I am willing to give it credit as a predisposing cause by inducing debility, but as the immediate or exciting cause, its

influence I am disposed to doubt. Doctor Chalmers, in his diseases of South-Carolina, upon the subject of Cholera Morbus, makes the following observation. "In those who abound with acidity, the action of the stomach, and probably of the whole ^{ali}imentary canal, must certainly be more or less impaired: The secretory organs also being generally relaxed," therefore, he adds, "people of such habits are most liable to this disease." The following facts and considerations, however will, I hope, better establish this point. Doctor Kuhn informs his Pupils, that when in the West-Indies, in order to guard himself, as he then thought, against the diseases incident to that climate, made use of a sherbet of Tamerinds as his constant drink. In the course of one week after he had begun the use of it, he was attacked with a bilious Diarrhœa; he at the same time observed his skin and complexion to become remarkably fallow and bilious. As he had not changed his habit of living in any respect, but in the use of the Tamerind drink, he immediately suspected this to be the cause of his disease, and therefore immediately desisted from any farther use of it,—
the

the consequence of which was, his indisposition immediately went off without the use of any remedy, and the fallow hue in the skin gradually disappeared.

Another proof of an acid being present in the stomach, is that in all persons affected with Cholera; the first vomitings are extremely acid, and to use their own expressions, sour as verjuice; to this circumstance, add the sour smell and greenish color*, which so invariably distinguish the stools of a person labouring under Cholera, ~~from~~ *from* Bilious Diarrhœa, which diseases I conceive only differ in the vomiting which attends the one and not the other; nay, I will venture to observe, that in every instance we may be able to trace the cause to the action of such an acid.

Dr. Kuhn, (whose very extensive practice affords the most ample field for observation) also informs his pupils, “ that in every case of Cholera, which has fallen under his notice, he has always been able to trace the cause to acidity, to which he adds it is frequently brought on by eating cherries, pine-

* For the effects of acids, in changing the color of the bile to a green.—See M'Clurg.

pine-apples,—drinking four butter-milk,—four punch, lemonade, and a variety of other substances, which are either of an acedent quality, or subject to the acetious fermentation, “ but Physicians, contented with the idea of heat, think themselves at no loss in accounting for the disease from this cause: Nay, so far are they from the idea of its being produced by acidity, that it is not an unfrequent practice, even with the most eminent of the profession, (without in the least regarding the appetite of the Patient) to prescribe the liberal use of acids in the form of punch,—lemonade,—apple-water, and a variety of other formulæ of a similar nature, with the intention they observe of counteracting the effects of the bile, but as frequently I will add, are they disappointed. Thus, to ~~add~~^{use} the language of a Logician, “ One error induces another.”* From this

* Is it not possible that this practice in Cholera has arisen from its use in the Dysentery?—In the cure of which last disease, I will venture to add that vegetable acids, especially in the form of fruits, will prove specific, not only as anticeptic, but particularly as increasing the secretion of bile, the want of which fluid I can readily conceive, may be an exciting cause of this disease:—If this idea be admitted, I presume it will not be so difficult to determine.—“ What connection the Dysentery has with the state of the bile,” as Doctor Cullen supposed. See his first Lines, Vol. III.

this treatment then of Cholera, need we be surprised that this disease proves so frequently fatal, or perhaps, (to speak with more propriety) have we not cause for surprise that it is not still *more* fatal?—Lastly, another argument in favor of the theory I have been endeavoring to establish, and which also proves the inefficiency of heat, may be adduced from the women in the West-Indies, so frequently escaping the bilious diseases of that climate, while the men are seldom free from them:—It is also remarked, that the women are remarkably temperate, and scarcely ever taste any other drink but water; the consequence of which is, they live to enjoy a good old age, free from those diseases of intemperance, with which the other sex are * so invariably afflicted; among which those of a bilious nature, as Cholera's,—Bilious Diarrhœa's, &c. are the most common. I am also informed by a Physician from the island of Jamaica, that the Negroes are also much less afflicted with those diseases than the Whites, notwithstanding they are more exposed to the heat of the sun, constantly working under its scorching

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* For this fact I am also indebted to Doctor Kuhn.

ing rays: Upon enquiry, he also informed me, that they are in a great measure restrained from the use of the more acid and acescent ^{fruits} ~~fruits~~;—a circumstance which, in my opinion, explains the fact in the most satisfactory manner, more especially when we consider, that they are kept in almost constant exercise, and, of consequence, better able to resist the diseases, which their diet, as it is, (I would venture to add) would otherwise necessarily produce.

Doctor Rush, in his very valuable volume of Medical Enquiries upon the subject of the Cholera Infantum, objects to the idea of its ever being produced by the use of summer fruits, for this reason, that “the disease is but little known in country places, where children eat much more fruit than in cities.” This fact I admit, but with the utmost deference to the opinion of Doctor Rush, I conceive it does not in the least invalidate the theory I have been endeavouring to enforce, for I can very readily suppose, that a child in the country, (naturally more healthy) enjoying its pure cool air, can assimilate a much greater quantity of fruit, than the weak and puny infant,
confined

confined to the unwholesome effluvia of a city ;--- especially if we consider, that heat, by debilitat- ing the Stomach, and thus generating an acid, favors the secretion of bile, and that cool air corrects that secretion by a contrary effect. Here I beg leave to inforce a distinction between ab- solute cold, and what may be called a cool and moderate temperature ;---the former in common with extreme heat, also impairs the action of the alimentary canal, and favors the biliary secre- tion, while the latter by its tonic effects, cor- rects that secretion, and as the Doctor himself ob- serves in another page, 'Tis extremely agreeable to see the little sufferers revive, as soon as they escape from the city air, to inspire the pure air of the country ;" the same thing is observed of the bilious remitting fever, which, in proportion as the cool weather advances, changes its type ;--- these circumstances plainly prove, that cool air, by restoring the tone of the Stomach and its func- tions thus counteracts the effects of the acid, and, in this manner, corrects the secretion of bile, but still are no arguments to prove, that heat is the exciting cause of the disease by a specific ef- fect upon the biliary secretion,---no more so than

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that cold is the cause of scurvy, because it favors the morbid state of the system first induced by the excessive use of salted animal food*, or in other words, the want of vegetables. In this way I conceive it may be accounted for, why children in the country escape the disease, while those in the city suffer so much from it.

Another circumstance however remains to be mentioned, which also serves to explain this fact, and which affords another argument in favor of the presence of an acid—as in the scurvy, where an alkalescent state of the fluids† prevails, nature leads to the use of the acid fruits and vegetables. Thus, on the contrary, where these last abound, ~~And~~ is no less kind in pointing out the remedy, hence that appetite for butter, and the richest gravies of roasted meats, which Doctor Rush observes, “ they eat with an obvious relief to all their symptoms: From this circumstance, in the prevention of Cholera, the Doctor prescribes the use of salted meat, to which he, with great propriety adds, “ it is, perhaps, in part, from the daily

* See Cullen's first Lines.

† That such a state of the fluids exists in the Scurvy, and that this is a disease primarily of the fluids.—See Trotter on Scurvy.

daily use of salted meat in diet that children of country people escape this disorder." Do not these circumstances evidently demonstrate, that heat alone is insufficient to produce this disease, and that its exciting cause is an acid in the stomach, whether generated from debility, or in consequence of the excessive use of summer fruits, which last I conceive is most probable, as these form so great a part of our diet in those seasons. Let us next enquire what effect this pathology of Cholera will have upon the cure of this disease.

METHOD OF CURE.

When we understand the cause of a disease, the method of curing it becomes simple and obvious; or to use the elegant language of Celsus, "*Estimatio causæ sæpe morbum solvit.*" In the treatment of Cholera, as with the intermittent fever, every old woman thinks she has a specific and unfortunately in almost every author who has hitherto written upon this subject, (not the judicious Sydenham excepted) we find as many and opposite remedies as the diseases has symptoms; an unquestionable proof, that its true cause was

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unknown,

unknown. While the mistaken notions of Boerhaave and others prevailed, in ascribing diseases to a lenter or morbid matter, (which are now so justly banished from our books of medicine) we need not be surprised at the variety of remedies and complicated prescriptions with which their works were filled;—fortunately for the happiness of mankind, those falacious theories which have so long eclipsed the science of Medicine, have almost disappeared; still, however, many diseases remain for the genius of some future Cullen to investigate; but from the industry with which Physicians are at present pursuing the subject, in America, as well as Europe, may we not (without the imputation of extravagance) remark, that the period is not far distant, when the opprobria medicorum will be terms inapplicable to any disease to which humanity is now exposed;—but to return from this digression, I flatter myself the Reader has already anticipated me in the cure of Cholera — Such is the importance of exactly ascertaining the cause of a disease before we attempt its cure. In the treatment of Cholera, two indications necessarily present themselves.

First, To neutralize the acid present in the
stomach

stomach, and Secondly, to prevent the future generation of it, or to obviate its remote causes.

To answer the first indication, we cannot have recourse to a more effectual remedy than an alkaline salt, of which the salt of tartar in solution, combined with laudanum, and a few drops of the spirit of Lavender or Cinnamon water will probably be found the most agreeable;—if the disease is attended with spasmodic affections, and these are violent, perhaps the volatile sal ammoniac, will be still more effectual, as it is not only quicker in its operation, but also acts as a powerful antispasmodic, and stimulant to the nervous system; but as neither the vegetable nor volatile alkalis are agreeable when given alone; the addition of the Laudinum may have a very good effect, and that exclusive of its stimulent or sedative operation so much at present contested; the effect, I allude to is that of diminishing the secretion of bile.*

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* This fact, I believe, none will dispute.—Whoever doubts it, however may readily be satisfied, by examining the stools of a person before and after the use of opium,—In which last case they scarcely discover the least tinge of bile, appearing rather of a whitish color.—Is it not from this circumstance chiefly, that constiveness is the so common effect from the use of opium?

The Laudanum in this disease then acts not only as a palliative remedy, but also obviates the proximate cause of the disease which I before observed, consists in a too copious secretion of bile.

Having, by a proper administration of these remedies, mitigated the most violent symptoms, our next indication will be to restore the tone of the stomach, by which we may prevent the future generation of an acid.

The means of answering this indication are to be found in the use of *tonic medicines, and a stimulating nourishing diet*, to which add exercise and cool air.

Of the great variety of Medicines under the class of *Tonics*, which may be prescribed with this intention; in Cholera I consider the vitriolic acid and Columba root as best calculated;—to some it might appear a paradox. that the Disease should be prevented by an acid, when it is an acid that produces it, but the difficulty is easily solved, by considering the debilitating effects of the one, and the tonic effects of the other;---there is still, however, another advantage from the vitriolic acid in common with the mineral acids,
viz.

viz. that of decomposing the bile*, and thereby rendering it inert ; of its efficacy in this disease, I can speak with confidence, as I have not only seen it given with success, but have also been informed of its good effects in a variety of instances.

Doctor Rush, in his Enquiry upon the Cholera Infantum observes, that “ allum has been prescribed with great success by the Physicians of the Philadelphia Dispensary.” The efficacy of this Medicine, however, I conceive, depends entirely upon the vitriolic acid it contains, of which, in fact, it is chiefly composed.

The Columba Root may be exhibited either in powder or infusion as circumstances may determine ;---if, in the form of infusion, it will be rendered perhaps much more pleasant, by the addition of a few drops of the Elixir of Vitriol. The Columba also has its peculiar advantages in this disease, particularly that of correcting the acrimony of the bile. § This effect, however as specific, Doctor Cullen in his Materia Medica, is disposed to doubt. He observes, “ that in stopping vomiting it has frequently answered, but in ma-

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* See M'Lurg on the bile.

§ See Penival's Experimental Essays.

ny instances it has failed entirely, and even in cases where there seemed to be a redundancy of bile ;” but as one of the most agreeable bitters, (and by no means deficient in strength) it undoubtedly may be exhibited with great advantage.

Upon the subject of diet, I will now submit my Patients to the treatment prescribed by Dr. Brown, consisting of rich soup,---roast beef,---and even a glass of good old Madeira; the first of these articles in this disease we cannot use too freely, either as an article of nourishment, or as a mucilage, serving to cover the acrimony of the bile, for both of which purposes it is most happily calculated.

From this treatment of ~~the~~ Cholera, which I presume will be no less agreeable to our Patients, and I will venture to add much more successful than the present practice of purging and vomiting, I flatter myself, this, as well as other bilious diseases, would become much less fatal than they hitherto have been.

— *Si quid novisti rectius istis,
Candidus imperti, si non his utere mecum.*

HOR. EPIST.

F I N I S.

Med. Hist.

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